

## **REMARKS**

### **SUMMARY:**

The subject application sets forth claims 1-21, of which claims 1, 9 and 15 are independent claims. Original claims 22-58 have been withdrawn per a restriction requirement.

The drawings and the specification of the original application stand objected to for reasons set forth in the previous Office Action. Original claims 1-21 stand rejected under 35 U.S.C. §112, first and second paragraphs. Original claims 1-8 stand objected to as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. Claims 1-6 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over “New designs of ultra wideband communication antennas using Genetic algorithm”, IEEE 1997 (Altman et al.) in view of U.S. Patent No. 6,317,092 (de Schweinitz et al.) Original claims 9-13, 15-17 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Altman et al. in view of de Schweinitz et al. and further in view of “Design of electrically loaded wire antennas using Genetic algorithm”, IEEE 1996 (Boag et al.) Original claim 21 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Altman et al. in view of de Schweinitz et al. and further in view Boag et al. and U.S. Patent No. 6,346,916 (Odachi et al.)

Responses to the characterizations outlined above (including traversal of the prior art rejections) are hereafter presented in the order listed in the December 23, 2004 Office Action.

### **OBJECTIONS TO THE DRAWINGS:**

The original drawings stand objected to for various reasons as set forth in the Dec. 23, 2004 Office Action. In response to such objections, a new set of figures is presently submitted as Appendix A. Such figures are consecutively numbered, generally in the order in which they are referred to in the specification, and are provided without missing figure numbers. Previously submitted duplicate figures have been removed. Figures previously incorporated into pages 129-185 of the original specification have been extracted and provided as part of the presently submitted new set of figures. Each figure has been listed with a corresponding description in the Brief and Detailed Description sections of the specification. None of the changes made vis-à-vis the new set of figures adds any new matter to the subject application.

### **OBJECTIONS TO THE SPECIFICATION:**

The original specification stands objected to for various reasons set forth in the December 23, 2004 Office Action. In response to such objections, the specification and claims have been prepared all in double line spacing and now with line numbers. The previous portion of the specification provided on original pages 129-185 has been altered from its previous presentation-style format to be incorporated with other portions of the specification in recommended format. The previously submitted computer program listing on pages 36-128 of the original specification has been removed and is now provided as a computer program listing appendix submitted on compact disc. The abstract is also provided with proper language and within the recommended range of total words. None of the above modifications incorporated into the substitute specification provided herewith add any new matter to the subject application.

### **35 U.S.C. §112 REJECTIONS (CLAIMS 1-21):**

Original claims 1-21 stand rejected under 35 U.S.C. §112, first paragraph as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Original claims 1-21 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 1-21 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-8 are rejected under 35 U.S.C. §112, second paragraph as being allegedly incomplete for omitting essential steps, such omission amounting to a gap between the steps.

In light of the presently submitted amendments and the following remarks, Applicants respectfully request withdrawal of the various rejections of claims 1-21 under 35 U.S.C. §112.

With regard to claim 1, the preamble of such claim is presently amended to remove previous reference to the term "optimum design specifications" since such term causes confusion and is not necessary to the described method set forth in such claim. Furthermore, the term "design criteria" in original claim 1 is presently modified to read "design parameters", which may be a more appropriate term for the type of information provided as input to the algorithmic

process of present claim 1. Also, the previous term in original claim 1 “basic antenna configuration” has been changed to “driven antenna structure” to clarify what was intended by the original claim language. The term “basic antenna configuration” was intended to refer to a driven antenna structure without parasitic elements. Once parasitic elements are designed and added to the driven antenna structure in accordance with the antenna design method of claim 1, “improved antenna structures” result. Additional claim language in the identifying step of original claim 1 is intended to more accurately represent the disclosed aspects of determining a fitness value in accordance with the present subject matter.

With regard to claims 2-8, various additional modifications as set forth in the presently submitted amendments are intended to clarify the language in such claims to be consistent with the language used in the original specification and to otherwise put such claims in form for overcoming all the pending rejections under 35 U.S.C. §112. With regard to claim 6, Applicants note that pages 138-139 of the original specification disclose the use of the subject design method and application thereof to a straight wire monopole antenna. When a straight wire is utilized as the driven antenna structure of present claim 1, analysis is disclosed for the addition of two or four parasites around such straight wire driven element to achieve improved antenna configurations. As such, support for the “sleeve monopole antenna” of claim 6 exists.

With regard to claims 9, 12 and 15, amendments have been made to clarify aspects of the assignment of fitness values in accordance with the subject method for designing a sleeve antenna structure. Additional amendments made to claims 1-21 are intended to provide such claims in proper form, accurately setting forth various aspects of the presently disclosed technology and overcoming all previous rejections under 35 U.S.C. §112. Withdrawal of the 35 U.S.C. §112 rejections and allowance of claims 1-21 is respectfully requested.

**35 U.S.C. §103(a) REJECTION (CLAIMS 1-6 AND 8):**

Original claims 1-6 and 8 stand rejected under 35 U.S.C. over “New designs of ultra wideband communication antennas using Genetic algorithm”, IEEE 1997 (Altman et al.) in view of U.S. Patent No. 6,317,092 (de Schweinitz et al.)

Present claim 1 sets forth a method of designing omni-directional broadband antennas including, in part, a step of executing an algorithmic process to determine size and position of parasitic elements for combination with a driven antenna structure. The Examiner aptly notes on

numbered page 29 of the December 23, 2004 Office Action that Altman et al. does not expressly teach executing the algorithmic process disclosed therein to determine the size and position of parasitic elements for combination with the driven antenna structure to create improved antenna configurations. The Office Action proceeds to set forth that de Schweinitz et al. teaches determining the size and position of parasitic elements for combination with the basic antenna configuration (i.e., driven antenna structure) to create improved antenna configurations.

de Schweinitz et al. recognizes that parasitic elements can yield certain advantages for some antenna embodiments. Applicants admit on page 3, paragraph 3 of the original specification that “it is well known that adding additional parasitic straight wires to either side of a driven dipole antenna may increase the bandwidth of the dipole” and that one must be especially careful to choose parasitic elements with proper length and spacing. This much is not disputed. However, application of an algorithmic process as set forth in present claim 1 to actually determine the size and position of such parasitic elements is a feature that is not disclosed singularly or in combination of the Altman et al. and de Schweinitz et al. references. Neither reference uses the execution of an algorithmic process to determine size and position of parasitic elements for combination with a driven antenna structure.

It should be appreciated that to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See also §2143.03 of the MPEP. Since the limitation set forth in present claim 1 of executing an algorithmic process to determine size and position of parasitic elements for combination with a driven antenna structure is not disclosed singularly or in combination of the Altman et al. and de Schweinitz et al. references, such references cannot by law render present claim 1 unpatentable. Reconsideration of the 35 U.S.C. §103(a) rejection and allowance of present claim 1 is respectfully requested.

With regard to claim 6, the December 23, 2004 Office Action asserts on numbered page 31 that de Schweinitz et al. teaches a sleeve monopole antenna as produced by the design method of claim 1. de Schweinitz et al. may teach a monopole antenna feed element surrounded by various parasitic and/or reflector elements, but such reference does not teach the design method of claim 1 as set forth above. Such reference particularly fails to set forth the aspect of executing an algorithmic process to determine size and position of parasitic elements. As such, de Schweinitz et al. fails to disclose all elements of present claim 6. As such, Applicants

respectfully request withdrawal of the 35 U.S.C. §103(a) rejection of claim 6 and allowance of such claim.

With regard to claims 2-5 and 7-8, such claims variously depend from otherwise allowable independent claim 1 and further limit same. Since claim 1 should be allowed based on the above distinctions over the cited references, claims 2-5 and 7-8 should also be allowed and Applicants respectfully request acknowledgement of the same.

**35 U.S.C. §103(a) REJECTIONS (CLAIMS 9-13, 15-17 and 19-21):**

Original claims 9-13, 15-17 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Altman et al. in view of de Schweinitz et al. and further in view of “Design of electrically loaded wire antennas using Genetic algorithm”, IEEE 1996 (Boag et al.) Original claim 21 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Altman et al. in view of de Schweinitz et al. and further in view Boag et al. and U.S. Patent No. 6,346,916 (Odachi et al.) Based on the presently submitted amendments and the following remarks, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §103(a) rejections.

With reference to present claim 9, such claim sets forth a method for designing a sleeve antenna structure, including in part a step of using an algorithmic process to generate a population of individual antenna designs, where each design is assigned a fitness value relating to the bandwidth ratio of a highest frequency to lowest frequency within a selected frequency range of operation for which voltage standing wave ratio is less than some predetermined value. None of the cited references disclose singularly or in combination a step of employing an algorithmic process to generate individual antenna designs, where a specific fitness value as set forth is calculated for each antenna design. General objective functions are determined for various antennas in Boag et al., but a specific fitness value relating to the bandwidth ratio of a highest to lowest frequency within a selected frequency range of operation for which VSWR is less than some predetermined value is NOT disclosed in Boag et al. or any other reference cited against original claim 9. As such, present claim 9 should be allowed over such references.

With reference to claim 10, Applicants note that none of the references cited against such claim singularly or in combination disclose the use of an algorithmic process (e.g., a genetic

algorithm) to determine the size and position of parasitic elements provided around a driven antenna element. As such, claim 10 should be allowed over such references.

With regard to claims 11-14, such claims variously depend from otherwise allowable claim 9 and further limit same. Since claim 9 should be allowed based on the presently submitted amendments and the present remarks, claims 11-14 should also be allowed.

With reference to independent claim 15, Applicant notes that such claim sets forth a method for designing and producing antennas including, in part, a step of performing at least first and second iterations of an algorithmic process to generate antenna designs and assign fitness values for such antenna designs, wherein such antenna designs are characterized as having a sleeve configuration with a central antenna portion surrounded by a plurality of parasitic elements. Applicants note that none of the references cited against claim 15 include specific sleeve antenna configurations used in a design process as set forth in present claim 15. Optimization of parasitic element size and position using a design algorithm is not disclosed or suggested in such references. As such, all elements of present claim 15 are not disclosed singularly or in combination of the cited references and as such, those references cannot serve to render claim 15 unpatentable. Since all claim limitations are not taught or suggested in the art cited against claim 15, Applicants respectfully request reconsideration of the 35 U.S.C. §103(a) rejection and allowance of present claim 15 is respectfully requested.

With regard to claims 16-21, such claims variously depend from otherwise allowable claim 15 and further limit same. Since claim 15 should be allowed based on the presently submitted amendments and the present remarks, claims 16-21 should also be allowed.

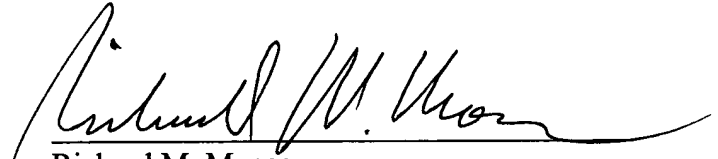
#### **CONCLUSION:**

Inasmuch as all outstanding issues have been addressed it is respectfully submitted that the present application, including claims 1-21, is in complete condition for issuance of a formal Notice of Allowance, and action to such effect is earnestly solicited. The Examiner is invited to telephone the undersigned at his convenience should only minor issues remain after consideration of this Response in order to permit early resolution of the same.

Respectfully submitted,

DORITY & MANNING,  
ATTORNEYS AT LAW, P.A.

Date: May 23, 2005



Richard M. Moose  
Registration No.: 31,226

Customer ID: 22827

Telephone: 864-271-1592

Facsimile: 864-233-7342